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(54) TV RECEPTION CARD SUPPORTING THE VARIOUS VIDEO COMPRESSION FORMATS USING THE DSP

## Abstract

Machine Translation Human Translation

It are an object of the present invention to provide the multifunction coding support TV reception card which compresses the TV signal which is received by using the characteristic of the DSP (Digital Signal Processor) canning particularly be programmed as the thing about the TV reception card used in the personal computer (PC) etc. to the various compression method and it supports moreover, data format transcoding function between the different compression method, and in that way uses DSP solving the problem of the TV reception card using the compression method fixed to the conventional hardware. To accomplish the above objects, the present invention is comprised of the TV tuner module accepting the TV signal, the video signal input accepting the external analogue video signal like the video signal, the analog to digital converter, DSP, and the digital to analog converter and the video signal output. The analog to digital converter converts the analog image signal inputted to the TV tuner module or the video signal input into the digital format and transmitted with the PC inside or DSP. DSP compression-releases the digital image information compressing the video signal transformed to the digital format according to the compression method which a user selects in advance and transmits inside PC or is compacted and transmitting with the PC inside or the external device and printing out or converting the video signal compacted to the specific format into the other compression format and transmitted with the PC inside. The digital to analog converter and the video signal output converts the compression-released digital image signal into the analog type and outputted to the PC outside. Users using the TV reception card through the present invention can not give the processing burden to CPU and it can compress the moving picture information in which it is necessary to have the storage of the bulk to the hardware dependent like the TV signal on a real time basis. It

can compress to the various mode in which a user wants. In addition, data format transcoding between the different compression method is possible in one apparatus.

Machine Translation | Human Translation

PURPOSE: A TV receiver card for supporting multiple moving picture compression format using DSP(Digital Signal Processor) is provided to be capable of compressing analog picture signals without overloading a CPU or decompressing compressed digital picture information using programmable DSP characteristics.

CONSTITUTION: A TV tuner module(10) receives TV signals, and a picture signal input(20) receives video signals. An A/D converter(30) converts analog picture signals into digital signals. A DSP(40) compresses the digital picture information, decompresses compressed digital picture information, or converts the compression format. A PC bus interface(70) transmits data between the TV receiver card and a PC. A D/A converter(50) converts decompressed digital picture information into analog picture signals. A picture signal output(60) outputs the converted analog picture signals to external devices such as a TV or a VTR.

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## Representative Drawing(s)

Fig. 1

## Keyword(s)

The TV reception card, compression method, the DSP (Digital Signal Processor), the TV tuner module, analog to digital converter, digital to analog converter, compression transform, MPEG-1, HPEG-2, MPEG-4.

## Descritption

### Brief explanation of the drawing

2 Fig. 1 is a block diagram of the invention system

3 Fig. 2 is a hardware flowchart of the image data compression process of the present invention apparatus

4 Fig. 3 is a hardware flowchart of the image data compression release process of the present invention apparatus

5 Fig. 4 is a hardware flowchart of the image data compression conversion process of the present invention apparatus

6 [: The description of reference numerals of the main elements in drawings.

7 10: TV tuner module 20: video signal input.

8 30: analog to digital converter 40:DSP(Digital Signal Processor)

9 50: digital to analog converter 60: video signal output.

10 70: PC bus interface part.

- Details of the Invention
- Purpose of the Invention

The Technical Field to which the Invention Belongs and the Prior Art in that Filed

11 The present invention relates to the TV reception card looking at TV in PC, particularly, to the multiple coding format support TV reception card using DSP compressing the TV signal which is received by using the characteristic of the DSP (Digital Signal Processor) canning be programmed to the various compression method of a standard or a nonstandard and support moreover, the compression of data format conversion function between the different compression method.

12 Generally, the TV reception card is composed of the TV tuner module, outputting the channel which receives the TV electric wave and selected to the analog image signal the video decoder converting the analog video into a digital and the PC bus interface chip for sending to the mainboard side of PC in order to indicate digital video data in a screen or store in the hard disk.

13 In the method for storing video data in the hard disk, it has the method for storing with nots compressing and the software condensing program operating on the main memory of PC or the method it compresses by using the hardware module and for storing. The disk space is very much occupied in case of not compressing. If for example, the screen of 320x240 size is not per second compressed to 30 screen and it stores, in the transmission rate, about 4.6MB / sec at this time per second. In this way, when 1 minutes was stored, the capacity of 276.5MB is occupied. And the capacity of 1GB is unable to record 4 minutes as yet.

14 So, there can be the software compression method for storing in the next hard disk compressed with the condensing program which operates in the system memory after sending the moving picture which does not compress with the hardware compression method for being sent to the mainboard side of PC to the Hoo which compresses through the PC bus by the system memory of PC through the PC bus as the hardware dependent in the method compressing in case of a most and storing, and for compressing.

15 Recently the standard compression method for compressing the screen of the relatively small size like the MPEG-1 which was possible through the method which was previously hardware as the performance of PC became higher became possible. However, there is a problem that it has CPU having a speed more than 1GHz in case of compressing to MPEG-2, it is possible. In addition, many system resource is used as much as the other task cannot be nearly at the same time.

16 For this reason, it has the rising factor which is the cost. However, the compression method which is the hardware dependent is preferred the user desiring the compression at the stable environment. It is more the effective sharp-edged tool because that it pays an expense so that the mainly performs this task user use the hardware compression than it pays an expense in order to enhance the CPU speed from the user who.

17 DVD began to be popularized. A broadcast the digital television soon started, the moving picture compression standard of MPEG-2 was altogether adopted in this two kinds of technology. MPEG-2 stores the moving picture of the high definition. It is the result which is acknowleged as the suitable standard because of transmitting, however MPEG-2 has the fatal weakness in the PC environment. It is a thing called the excessiveness in the current general internet transmission rate to transmit through a thing and the internet that it occupies many capacity when storing in the hard disk.

18 Recently, it is the trend that applies the MPEG-4 standard to the coding in order to overcome the disadvantage of being like that. MPEG-4 was the standard including a graphic besides the coding, virtual reality, and many thing including the audio synthesis etc. However, the standard began to be among them the storage used in case of especially, the coding including the next generation mobile communications dead person IMT-2000 for the internet streaming service, and CD or the hard disk as below *** format.

19 Of course, there is a problem that the moving picture compressed to the method of MPEG-2 a conversion is possible through MPEG-4 for the hard disk or the internet streaming service. However, it takes the time to be many as much as 3~4 hours hang at least in order to convert the video about the tridal range 1 hour in the high system of a specification.

20 In case of the hardware, the reconstitution of the analog state is possible after the compression saving of MFEG-2 and editing. However, the card for PC which has such function because of performing the role of converting into MPEG-4 in the hardware chip itself in MPEG-2 is not yet sold. Particularly, there is a problem that in case of the digital television apparatus for PC, it has the MPEG-2 decompression function. And it has the archiving facility of the MPEG-2 video. But data of the time to be many cannot be stored because MPEG-2 very much occupies the storage.

## Technical challenges of the Invention

21 Therefore, an object of the present invention is to provide the multiple coding format support TV reception card which does not give the processing burden to CPU and compresses the analog image signal inputted through the TV reception card to the various compression method and by using the characteristic of DSP canning be programmed stores inside PC, or uses DSP which can compression-release the digital image information which is compressed to the various form and is stored inside PC and can press and can transform.

## Structure & Operation of the Invention

22 The technical composition of the present invention for being a purpose healthy with per converts the analog image signal inputted through the TV tuner module or the video signal input into the digital form through the analog to digital converter. It directly transmits the video signal converted into a digital format with the PC inside through the PC bus interface part or it compresses according to the compression method which a user selects through DSP in advance and it transmits through the PC bus interface part with the PC inside. By selectively compression-releasing the digital video compression information of the PC inside through DSP and transmitting with the PC external device through the analog to digital converter or pressing and transforms and measuring with the PC inside and transmitting it is moreover in the various compression method and the TV reception card for supporting the compression format conversion.

23 Concretely below, and the configuration of the present invention apparatus attached decide to be looked into.

24 Fig. 1 is the block diagram about the present invention apparatus.

25 Here, as shown in it endures and it becomes, it is comprised of the present invention apparatus of the TV tuner module (10) accepting the TV signal, the video signal input (20) accepting the video signal, the analog to digital converter (30) converting the analog image signal into the digital format, the DSP (40), the PC bus interface part (70) for data transmission between the present invention apparatus and the PC inside, the digital to analog converter (50) converting the compression-released digital image information into the analog image signal, and the video signal output (60) outputting the video signal transformed to the analog type to the external device including TV or VTR etc. The DSP (40) converts with compression format whether it compresses the digital image information or it compression-releases the compacted digital image information.

26 Concretely below, and the decompression of the video signal compression of the present invention apparatus and digital video compression information and compression format conversion process decide to be looked into.

27 Fig. 2 is a hardware flowchart of the image data compression process as to the present invention apparatus.

28 Here, as shown in it is referred, it is inputted through the respective TV tuner module (10) or the video signal input (20) and the analog image signal including the TV signal or the video signal etc. is transmitted to the analog to digital converter (30). The analog to digital converter (30) converts the transmitted analog image signal into the digital form and it selectively transmits with the PC bus interface part (70) or the DSP (40).

29 Here, the case of transmitting the video information transformed to the digital form with the PC bus interface part (70) is the case of directly transmitting with the mainboard of the PC inside without the compression process and outputting the video signal through the PC monitor. And the case of transmitting with the DSP (40) is the case of compressing the video signal converted into a digital format and first of all, storing inside PC.

30 In case the video signal converted into a digital format is transmitted in the DSP (40), the image data compression software which a user simultaneously selects in advance is transmitted to DSP from the mainboard of the PC inside.

31 The DSP (40) compresses the video signal which is converted into a digital format and is transmitted according to the compression method which a user selects in advance and it transmits with the PC bus interface part (70). And it transmits the compacted video signal with the PC inside and the PC bus interface part stores.

32 Fig. 3 is a hardware flowchart of the process of compression-releasing the digital video compression information and outputting of the PC inside as to the present invention apparatus.

33 Here, as shown in it endures and it becomes, if the digital video compression information of the PC inside is transmitted through the PC bus interface part (70) in the DSP (40), the software for simultaneously lifting the compression of the image compression information is automatically transmitted to the DSP (40) from the mainboard of the PC inside. As to the DSP (40), by using the automatically transmitted decompression software, it lifts the compression and it selectively transmits the transmitted digital video compression information with the digital to analog converter (50) or the PC bus interface part (70).

34 Here, in case of transmitting the compression-released digital image information with the digital to analog converter (50), it outputs through the video signal output (60) to the external device including TV or VTR etc. It outputs through the mainboard of the PC inside to the PC monitor in case of transmitting with the PC bus interface part (70).

35 Fig. 3 is a hardware flowchart of the process of converting the compression format of the digital video compression information as to the present invention apparatus.

36 Here, as shown in it endures and it becomes, if the digital video compression information of the PC outside or the PC inside is transmitted through the respective video signal input (10) or the PC bus interface part (70) to the DSP (40), the compression transform software which a user simultaneously selects in advance is transmitted to the DSP (40). The DSP (40) converts into the compression format which compression-releases by using the compression transform software in which a user selects the compression format of the transmitted digital video compression information in advance and is designated. The digital image information pressed and transformed is transmitted through the PC bus interface part (70) inside PC and it is stored.

## ▸ Effects of the Invention

37 In the above, it illustrates. And the present invention has the effect that whereas the effect that can support the various modes of compressions and decompression, and the compression transform and is similar to the software solution as to the compression of the moving picture signal in one apparatus by mounting DSP having the characteristic of canning be programmed to the TV reception card, is produced, the smooth multiple job operation which it does not exhaust the load and system resource of CPU like the software solution since compressing to the hardware dependent through DSP and compression-releasing and has with stability and is possible.

38 Moreover, there can be the effect of the characteristic supporting the compression method of the nonstandard which can be used as the increment of the improvement of a performance as well as the standard compression method, or the compression ratio, including, a purpose including MPEG-1, MPEG-2, MPEG-4 etc. it is not standard the characteristic of DSP canning be programmed is used.

## Scope of Claims

Claim[1] :

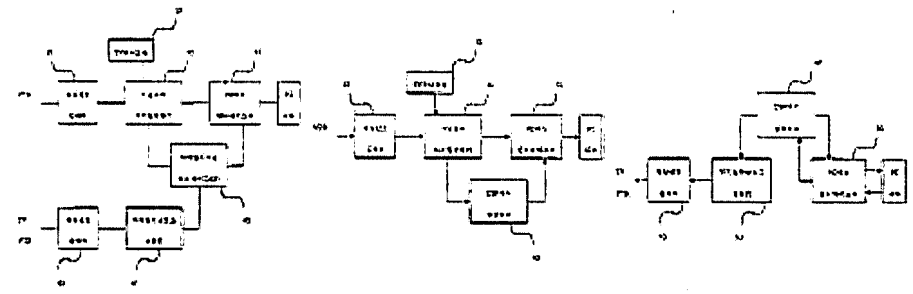
39 The multiple coding format support TV reception card using DSP of the TV reception card, wherein: it is comprised of the TV tuner module accepting the TV signal, the video signal input accepting the external analogue video signal like the video signal, the analog to digital converter, DSP, the digital to analog converter, and the video signal output outputting the analog image signal transmitted from the digital to analog converter to the PC external device including TV or VTR etc; the analog to digital converter converts the analog image signal inputted to the TV tuner module or the video signal input into the digital format and transmitting with the PC inside through the PC bus interface part or transmitted with DSP; DSP compresses the video signal transformed to the digital format according to the compression method which a user selects in advance and transmitting through the PC bus interface part inside PC or converting compacted digital image information which are transmitted from the PC inside through the PC bus interface part with the decompression or the compression format and . which it selectively transmits with the PC inside through the PC bus interface part through the analog to digital converter with the PC external device in other words; and the digital to analog converter converts the digital image signal which is transmitted to DSP from the PC inside and is compression-released into the analog type and transmitted with the video signal output.

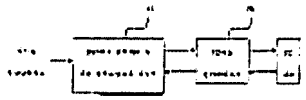
Claim[2] :

40 The moving picture compression method using DSP of the moving picture compression method comprising: the step transmitted with DSP, the step transmitting the software, the step that it transmits with the PC inside through the PC bus interface part it compresses the digital image information transmitted in DSP it uses the software or the step that selectively transmits the compacted digital image information of the PC inside with DSP, the step transmitting the software, the step that compression-releases the compacted digital image information, the step that converts the digital image information transmitted in the digital to analog converter into the analog type and transmitted with the video signal output, and the step outputting the analog image signal to the external device including TV or VTR etc. through the video signal output the analog image information inputted to the video signal input is converted into the digital format through the analog to digital converter; the step transmitting the software simultaneously respects the image data compression to do with DSP from the mainboard of the PC inside; the step transmitting the software respects to simultaneously do the image data compression cancel release with DSP from the mainboard of the PC inside; and the step that compression-releases the compacted digital image information is transmitted in DSP and transmitting in the digital to analog converter or retransmited to the PC inside through the PC bus interface part.

Claim[3] :

41 The coding format conversion method using DSP of the coding exchanging method comprising: the step transmitting the compacted digital image information, the step transmitting the software, the step that it transmits with the PC inside through the PC bus interface part it presses and transforms the compacted digital image information as described above transmitted in DSP it uses the software or the step that selectively transmits the compacted digital image information of the PC inside with DSP, the step transmitting the software, and the step that it presses and transforms the compacted digital image information as described above transmitted in DSP by using the software and it retransmits to the PC inside through the PC bus interface part; the step transmitting the compacted digital image information is inputted to the video signal input with DSP; the step transmitting the software respects to simultaneously convert the image data compression conversion with DSP from the mainboard of the PC inside; and the step transmitting the software respects to simultaneously convert the image data compression conversion with DSP from the mainboard of the PC inside.





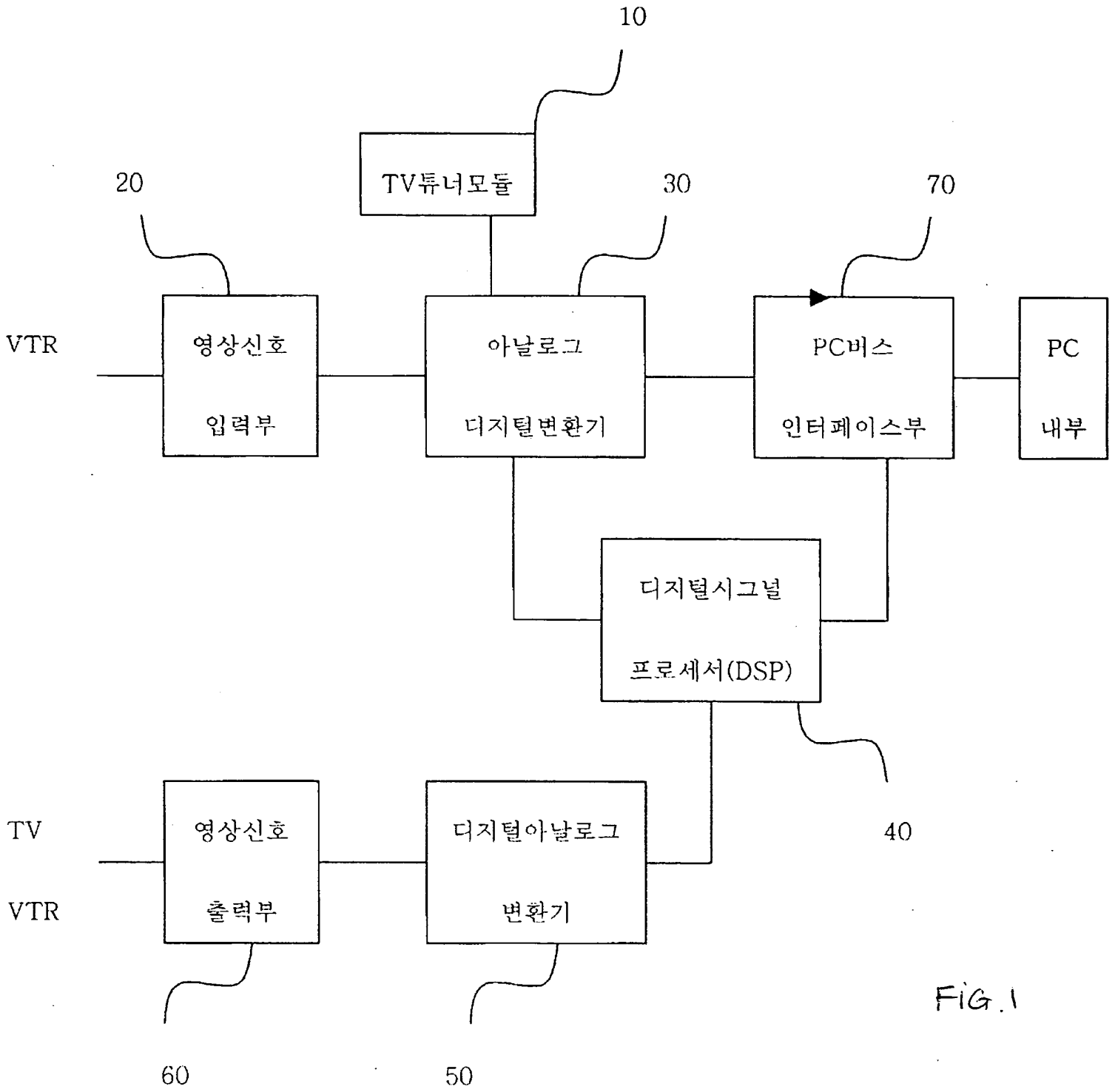

10
TV튜너모듈
20
30
70
VTR
영상신호
입력부
아날로그
디지털변환기
PC버스
인터페이스부
PC
내부
디지털시그널
프로세서(DSP)
40
TV
VTR
영상신호
출력부
디지털아날로그
변환기
60
50

FIG.1

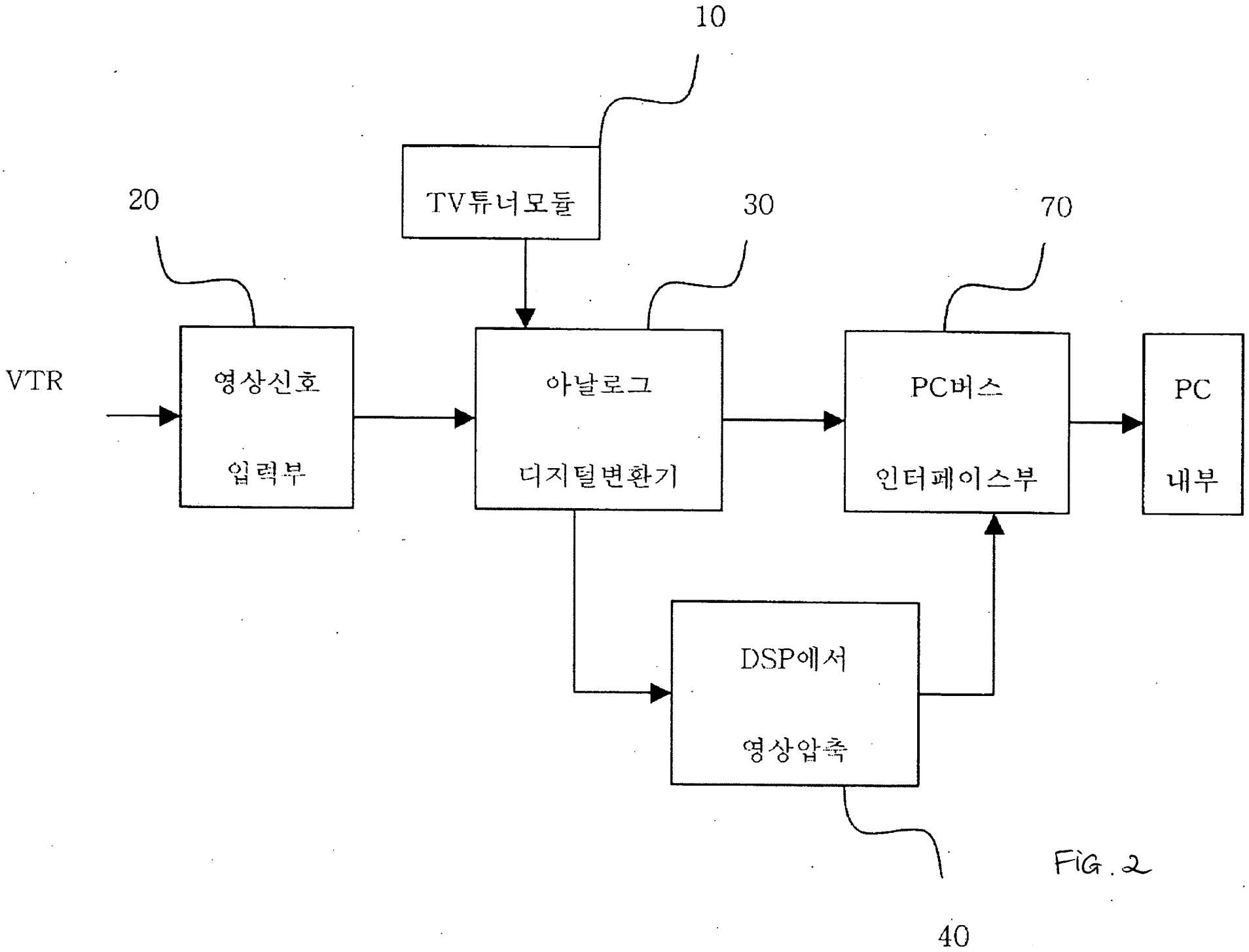

10
TV튜너모듈
20
30
70
VTR
영상신호
입력부
아날로그
디지털변환기
PC버스
인터페이스부
PC
내부
DSP에서
영상압축
40

FIG. 2

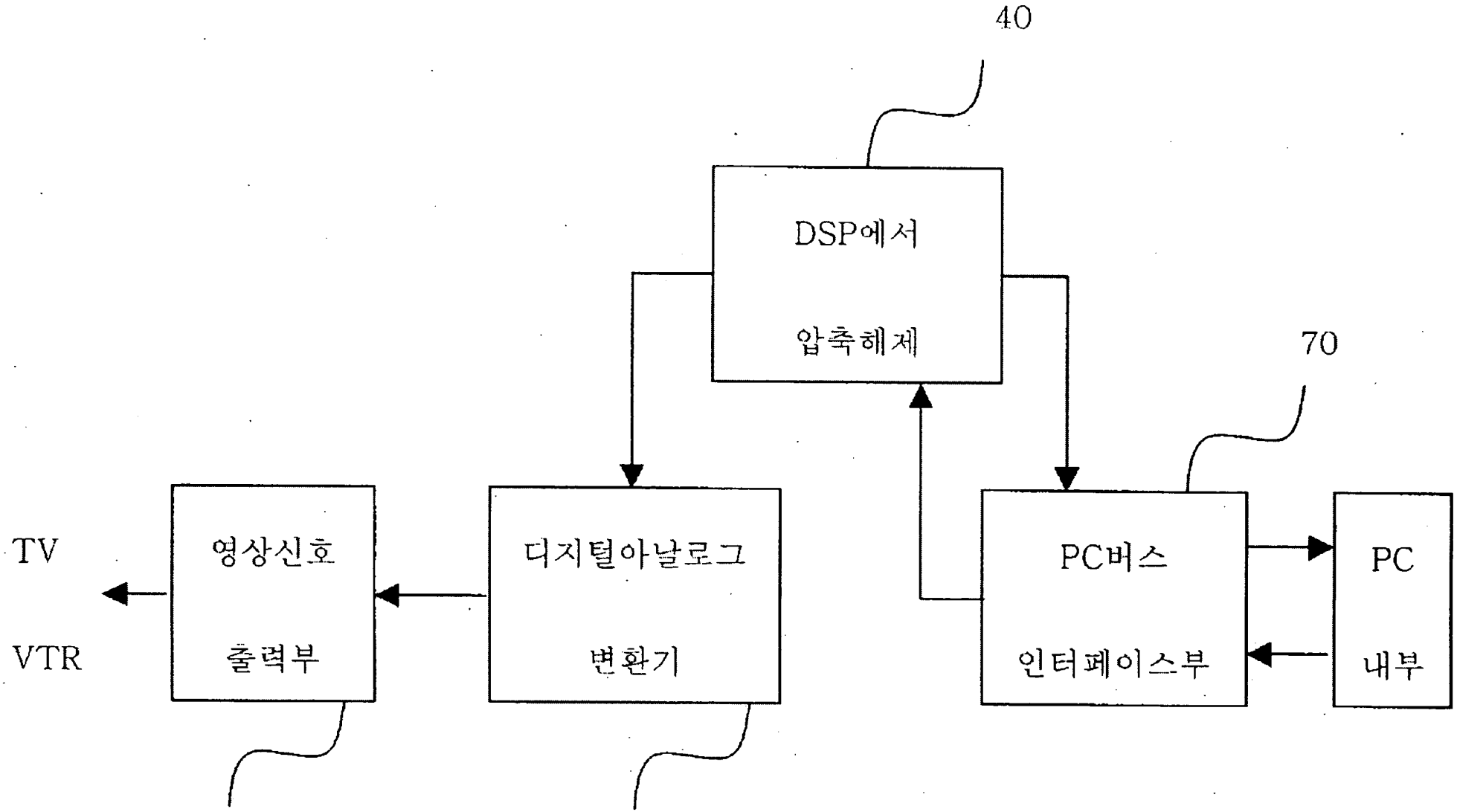

40
DSP에서
압축해제
70
TV
VTR
영상신호
출력부
디지털아날로그
변환기
PC버스
인터페이스부
PC
내부
60
50

FIG. 3

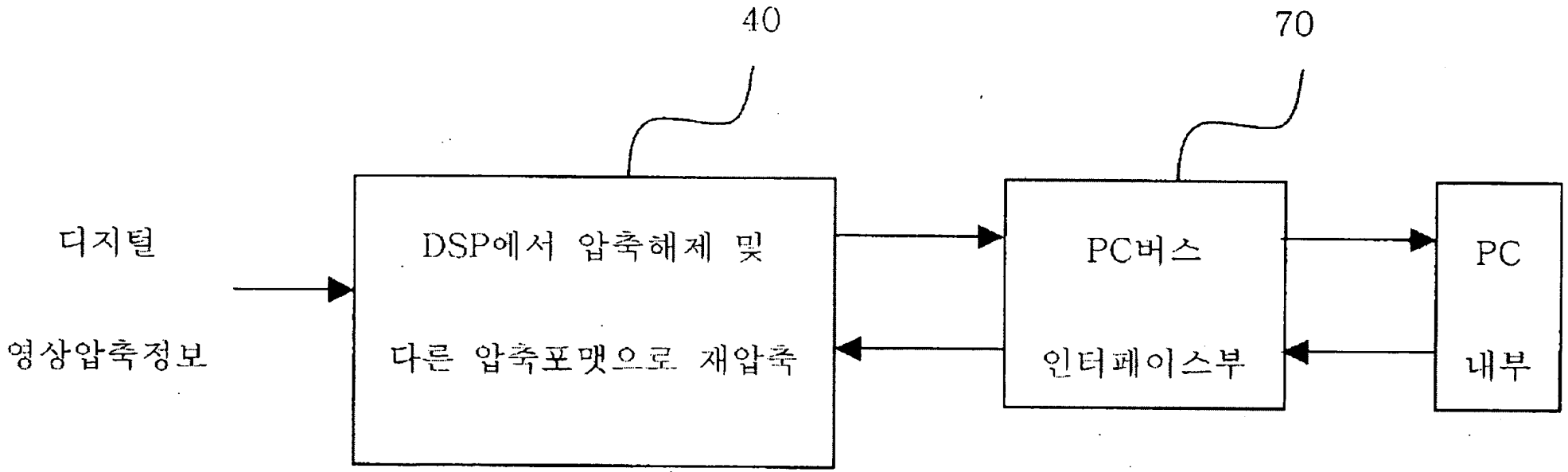



FIG. 4